

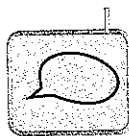
\$8 an Hour Problem

Using Multiple Representations, Part I

Objectives

In this lesson, you will:

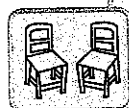
- Investigate different representations for problem situations.
- Determine values from graphs.
- Write equations.
- Identify variable quantities.



SCENARIO You are looking for a part-time job. Pat-E-Oh Furniture is hiring furniture assemblers. The job, to remove furniture parts from shipping containers and assemble furniture, pays \$8 an hour. After your interview, the company offers you the job and you decide to take it.

Problem 1

Earnings at Pat-E-Oh Furniture



- A. During the summer, you can work eight hours per day for 5 days each week. How much money will you earn after one week of work? Use a complete sentence in your answer.
- B. During the school year, you can only work 4 hours each day. How much money will you earn after one day? Use a complete sentence in your answer.
- C. You want to buy a bicycle for \$372. If you save every cent you earn, how many hours must you work in order to make enough money to buy the bicycle? Use a complete sentence to explain how you found your answer.
- D. If you save only half of the money you earn, how many hours must you work to make enough money to buy the bicycle? Use a complete sentence to explain how you found your answer.

If you could work 6 hours each day, how many days would it take you to earn enough money to buy the bicycle? Use a complete sentence to explain how you found your answer.

Key Terms

- labels
- units
- bar graph
- bounds
- graph
- algebraic equation
- solution

Investigate Problem 1

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1. You can keep track of the amount of money that you earn in a table. Whenever you create a table, begin by creating a row of **labels** that contains written descriptions for each column of numbers. You should also include a row of **units** that identifies the standard measurements in which each column of numbers is measured.

The table below shows the number of hours that you have worked for the first five weeks on the job. Complete the table. Copy the values into the table on page 28.

Labels Units	Week	Time worked	Earnings
		hours	dollars
	Week 1	11.5	
	Week 2	20	
	Week 3	16	
	Week 4	10	
	Week 5	9.5	

Use a complete sentence to explain how you found your earnings for each week.

Use the information in the table to answer Questions 2 through 5.

2. During which week did you earn the greatest amount of money? Use a complete sentence in your answer.

During which week did you earn the least amount of money? Use a complete sentence in your answer.

3. How much more money did you earn during Week 2 than during Week 3? Use a complete sentence in your answer.

4. How much money did you earn during the first five weeks on the job? Use a complete sentence in your answer.

Investigate Problem 1

17. Write an expression that you can use to find the earnings for any number of hours worked. Let h represent the number of hours worked. Use a complete sentence in your answer.
18. You want to determine your exact earnings for 40 hours of work. Would you use your graph or the expression in Question 17? Use complete sentences to explain your reasoning.



19. **Just the Math: Writing Equations** In Question 17, you wrote an algebraic expression to represent the earnings for any number of hours of work. You can also write an *algebraic equation* to generalize a problem situation. You can create an **algebraic equation** by writing an equals sign ($=$) between two algebraic expressions.

In this problem situation, suppose the earnings are \$120. Write an algebraic equation for this situation by using the expression that you wrote in Question 17.

Suppose the earnings are \$200. Write an algebraic equation for this situation by using the expression that you wrote in Question 17.

20. **Just the Math: Solutions of Equations** When you replace the variable in an equation with a number, you create a statement that is either true or false. If you create a true statement, the number that you used is a **solution** of the equation. Replace the variable in the equation $200 = 8h$ with the number 25. Then decide whether 25 is a solution of the equation $200 = 8h$. Show all your work. Write a complete sentence that explains your answer.

Decide whether the value of the variable is a solution of the equation.

$$225 = 5x$$

$$x = 45$$

$$204 = 32w$$

$$w = 6$$

$$108 = 12c$$

$$c = 9$$

Assignment

Assignment for Lesson 1,7

Name _____

Date _____

1

The Consultant Problem Using Multiple Representations, Part 2

Complete the conversion.

1. 30 min = _____ hr

~~2. 150 min = _____ hr~~

3. 2.75 hr = _____ min

4. 2.3 mi = _____ yds

~~5. 42 in. = _____ ft~~

6. 4.2 ft = _____ in.

Write an algebraic equation for each situation. Then identify the dependent and independent variables.

7. A plumber earns \$62 for each hour that she works. Let E represent her earnings in dollars for h hours of work.
8. A marathon runner averages 10 miles per hour. Let m represent the distance in miles run in h hours.
9. A seamstress can hem 3 skirts each hour. Let s represent the number of skirts she hems in h hours.
10. You earn \$12 for each yard you mow. Let E represent your earnings in dollars for mowing y yards.

Your aunt was recently hired to work for a large law firm. Over the course of her first year, she will work on several projects. She receives a stipend of \$3250 for each completed project.

11. What are the two variable quantities in this problem situation?
12. Which variable quantity is the independent variable? Write a sentence explaining your answer.
13. How much money will your aunt make if she completes 5 projects?
14. How many projects did your aunt complete if she earned \$32,500?